

REMARKS

In reply to the Office Action of November 15, 2006, Applicant submits the following remarks. Claims 1, 11, 26, 28, 43 and 49-50 have been amended. Support for the amendment to claim 26 can be found on page 13, starting at line 24 through page 14, line 6 in the specification as filed. Claims 11 and 43 were amended to further describe the emissive layer. Claim 28 was amended to change "and" to "or". Claim 49 has been amended to correct dependency. Claim 50 has been amended to more positively recite a pocket in the layer of resist. Applicant respectfully requests reconsideration in view of the foregoing amendments and these remarks.

Section 103 Rejections over Endo in view of Kwong

Claims 26-49 are rejected as being obvious and therefore unpatentable over U.S. Patent No. 6,787,063 ("Endo") in view of U.S. Patent No. 6,982,179 ("Kwong '179"). The applicant respectfully disagrees in light of the amendment to claim 26. In particular, applicant submits that the cited references do not teach or suggest a cross-linking agent that adds functionality in addition to cross-linking the first portion, as required by claim 26.

Endo describes an organic EL panel 70 having a pixel 71 with a hole injection layer 16 and a light-emitting layer 18 (FIG. 7, col. 10, lines 35-42, col. 11, lines 38-52).

Kwong '179 describes a hole transport layer 340 that can be insoluble in the solvent used to deposit an emissive layer (Figure 3, col. 10, lines 28-53). The hole transport layer can be cross-linked by photochemical or thermal treatment. If the material is cross-linked, suitable cross-linkable groups in the material to be cross-linked include acrylate, vinyl, diacetylene, epoxide and oxetane.

The Examiner argues that the cross-linking step taught by Kwong is considered to render the material different from an uncrosslinked material, such as by increasing mechanical strength and thermal stability of the layer (see Office Action, page 3). However, in applicant's claim 26 it is not the ability of the cross-linking agent to change the portion of the layer to a cross-linked layer that provides the added functionality. Rather, the cross-linking agent provides functionality to the first portion of the organic layer that the organic layers would not have without the cross-

linking agent. Claim 26 has been amended to further describe the cross-linking agent as “add[ing] the functionality in addition to cross-linking the first portion”. Applicant submits that Endo and Kwong ‘179 both fail to teach or suggest a cross-linking agent that adds a functionality other than cross-linking the hole transport layer. For at least this reason, applicant submits that no *prima facie* case of obviousness is pending after amendment of claim 26. Claims 27-49 depend from claim 26 and are similarly not obvious over Endo in view of Kwong ‘179.

Further, neither Endo nor Kwong ‘179 teach or suggest that the functionality added by the cross-linking agent is one of hole transport, electron transport, electron injection, hole blocking, optical confinement or waveguiding, as required by claim 27. Therefore, applicant submits that claim 27 is not obvious over Endo in view of Kwong ‘179 for this further reason.

The Examiner argues that “with regard to claims 33-36, the hole transporting layer made from PEDOT:PSS is deemed to have the property of wave-guiding, because PEDOT:PSS is the same material as taught by applicant for the hole transporting layer” (Office Action, page 2). Applicant respectfully points out that applicant’s specification does not suggest that PEDOT:PSS on its own has wave guiding properties. Rather, Applicant suggests in the specification, as well as in the claims, that PEDOT:PSS on its own typically does not provide the waveguiding function. “For instance, layers such as HTL 417 may have additional functionality not typically associated with HTLs such as wave-guiding properties” (see page 13, lines 22-24 in specification as filed). “[W]aveguiding, can be added to a layer which has a different primary function and a secondary function. For instance, as mentioned above, HTL 417 has a primary function of hole transport and a secondary function of electron blocking. For example, it may be possible to add wave-guiding functionality by modifying the levels of certain compounds such as phenyl or methyl groups which can serve to modify the index of refraction of the layer to which the modification is made.” (see page 20, lines 14-22 in the specification as filed).

The applicant describes adding waveguiding functions to a layer by modifying groups on a HTL material or bonding ions or groups to the PEDOT:PSS after cross-linking. Thus, after modifying groups on the PEDOT:PSS or bonding additional ions or groups to the PEDOT:PSS, the resulting modified polymer is no longer the PEDOT:PSS in the starting solution, because of the modified groups on the polymer constituents. It is not until the PEDOT:PSS is modified that the waveguiding properties are added to the material. The applicant does not suggest that

PEDOT:PSS itself, prior to adding the cross-linking groups has waveguiding properties. Thus, claims 33-36 are not anticipated or obvious over any of the references that merely suggest using PEDOT:PSS for a hole transport or conductivity layer.

Section 103 Rejections over Kwong '038 in view of Kwong '179

Claims 26-49 are rejected as being obvious and therefore unpatentable over U.S. Publication No. 2004/214038 ("Kwong '038") in view of Kwong '179. Applicant respectfully disagrees in light of the amendment made to claim 26. That is, neither Kwong '038 nor Kwong '179 teach or suggest a cross-linking agent that adds functionality in addition to cross-linking the first portion of organic layers.

Again, the Examiner premises the rejection on cross-linking providing insolubility, mechanical strength and thermal stability (see Office Action, page 4). However, Kwong '038 and Kwong '179 both fail to suggest or disclose a cross-linking agent that adds functionality in addition to cross-linking the first portion of organic layers, which is now required by claim 26. Applicant respectfully submits that after amendment of claim 26, there is no *prima facie* case of obviousness pending. Claims 27-49 depend from claim 26 and are similarly not obvious over Kwong '038 and Kwong '179.

Further, neither Kwong '038 nor Kwong '179 teach or suggest that the functionality added by the cross-linking agent is one of hole transport, electron transport, electron injection, hole blocking, optical confinement or waveguiding, as required by claim 27. Therefore, applicant submits that claim 27 is not obvious over Kwong '038 in view of Kwong '179 for this further reason.

Section 103 Rejections over Ito in view of Kwong '179

Claims 26-49 are rejected as being obvious and therefore unpatentable over U.S. Publication No. 2004/0021413 ("Ito") in view of Kwong '179. Applicant respectfully disagrees in light of the amendment made to claim 26. That is, neither Ito nor Kwong '179 teach or suggest a cross-linking agent that adds functionality in addition to cross-linking the first portion of organic layers.

The Examiner premises the rejection on cross-linking providing insolubility, mechanical strength and thermal stability (see Office Action, page 5). However, Ito and Kwong '179 both fail to suggest or disclose a cross-linking agent that adds functionality in addition to cross-linking the first portion of organic layers, which is now required by claim 26. Applicant respectfully submits that after amendment of claim 26, there is no *prima facie* case of obviousness pending. Claims 27-49 depend from claim 26 and are similarly not obvious over Ito and Kwong '179.

Further, neither Ito nor Kwong '179 teach or suggest that the functionality added by the cross-linking agent is one of hole transport, electron transport, electron injection, hole blocking, optical confinement or waveguiding, as required by claim 27. Therefore, applicant submits that claim 27 is not obvious over Ito in view of Kwong '179 for this further reason.

Section 102 Rejections over Towns

Claims 1-4, 6-7, 9-13, 15-22, 24-44, 46-48 and 50 are rejected as being anticipated by U.S. Publication No. 2002/0011779 ("Towns"). Applicant respectfully traverses in light of the amendment to claims 1, 26 and 50.

Towns describes an organic light-emitting layer and a conductive polymer in an electroluminescent device (Abstract and paragraph 0013). The conductive polymer can include a cross-linking agent, such as epoxy-silane.

Claim 1 has been amended to require a plurality of organic layers, wherein a first portion of at least one of the organic layers is cross-linked so that the first portion is insoluble in an organic solution, and the first portion includes one of an ester, a di-aromatic bromide, a photo-acid, an amide, a multivalent cation, or an acidic group as a cross-linking material. Claim 1 no longer lists a silane as included in the first portion of at least one of the organic layers. For at least this reason, applicant submits that claim 1 as amended, as well as claims 2-4, 6-7, 9-13, 15-22 and 24-25, which depend from claim 1, are not anticipated by Towns.

Claim 26 has been amended to require a cross-linking agent that adds functionality in addition to cross-linking the first portion. Towns does not suggest that epoxy-silane provides any functionality aside from cross-linking the conductive polymer. In fact, Towns states, "This component preferably does not significantly impair the performance of the device" (paragraph 0013), which indicates that the epoxy-silane has little effect other than cross-linking the layer.

For at least this reason, applicant submits that Towns does not anticipate claim 26 as amended. Claims 27-44 and 46-48 depend from claim 26 and are similarly not anticipated by Town.

Further, Towns fails to teach or suggest that the functionality added by the cross-linking agent is one of hole transport, electron transport, electron injection, hole blocking, optical confinement or waveguiding, as required by claim 27. Therefore, applicant submits that claim 27 is not anticipated by Towns for this further reason.

Claim 50 has been amended to require a layer of resist with a pocket therein. Towns fails to suggest or disclose a layer of resist with a pocket therein. For at least this reason, applicant submits that Town does not anticipate claim 50 as amended.

Section 102 Rejection over Kwong '179

Claim 50 is rejected as being anticipated by Kwong '179. Applicant respectfully traverses.

Kwong '179 fails to suggest or disclose a layer of resist with a pocket therein. For at least this reason, applicant submits that claim 50 as amended is not anticipated by Kwong '179.

Section 102 Rejection over Sirringhauss

Claims 1, 6-7, 14, 16 and 25 are rejected as being anticipated by U.S. Publication No. 2004/0266207 ("Sirringhauss"). Applicant respectfully traverses in light of the amendment to claim 1 to remove "an amine" from the list of cross-linking materials.

As noted by the Examiner, Sirringhauss discloses hexamethoxymethylmelamine as a suitable crosslinking agent for electroactive polymers (paragraph 0038). Claim 1 has been amended to remove amines from the list of cross-linking materials. Therefore, applicant submits that claim 1 is not anticipated by Sirringhauss as amended.

Section 102 Rejection over Ottermann

Claim 50 is rejected as being anticipated by U.S. Publication No. 2004/0266207 ("Ottermann"). Applicant respectfully traverses.

Ottermann fails to suggest or disclose a layer of resist with a pocket therein. For at least this reason, applicant submits that claim 50 as amended is not anticipated by Ottermann.

Applicant respectfully requests entry of the claim amendments and withdrawal of the rejections.

Allowable Subject Matter


Claim 23 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. Applicant thanks the Examiner for finding claim 23 to have patentable subject matter.

A Request for Continued Examination is being filed contemporaneously with this response.

The two-month extension of time fee in the amount of \$450 is being paid concurrently herewith on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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